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00558 | Analytical Article

Transformational Potential of Green Finance on International Business Arena: Digital Paradigm of New Economy

Anastasiia Tsybuliak*[1], Volodymyr Panchenko[2], Kyrylo Oliinyk[3], Viktoriia Karp[4], Tetiana Savanchuk[5]

[1]Department of International Economics, Business and Management, Ukrainian-American Concordia University, Kyiv, Ukraine. E-mail: anastasiia.tsybuliak@uacu.edu.ua
ORCID: https://orcid.org/0009-0007-9601-0391
[2]Department of Economics and International Economic Relations, Mariupol State University, Kyiv, Ukraine. E-mail: v.panchenko@mdu.in.ua | ORCID: https://orcid.org/0000-0002-5578-6210
[3]Economics and International Economic Relations Department, Mariupol State University, Kyiv, Ukraine. E-mail: kyrylo.oliinyk@mdu.in.ua | ORCID: https://orcid.org/0009-0007-6413-7259
[4]Department of International Business, Educational and Scientific Institute of International Relations, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine.
E-mail: viktoriia.karp@gmail.com | ORCID: https://orcid.org/0000-0002-2231-8517
[5]Department of Accounting, Taxation and Management of Financial and Economic Security, Dnipro State Agrarian and Economic University, Dnipro, Ukraine.
E-mail: savanchuk.t.m@dsau.dp.ua | ORCID: https://orcid.org/0000-0002-8584-0302
**Corresponding author*

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Abstract

This scientific article aims to study the dynamics of green bond issuance and identify the characteristics of key issuers' participation in the digital environment. The study used data from Climate Bonds for the period February-April 2025, supplemented by incomplete data for January and May. The total volume of green bond issuance was calculated monthly, and to identify the largest issuers, they were classified by issuance volume. The projects financed by these bonds were analyzed, followed by the application of statistical methods (using Excel analysis tools) to identify key trends. The results of the study show that the green transformation of international business is taking place amid growing institutional adaptation, the introduction of environmentally oriented financial instruments, and, at the same time, significant regulatory and information barriers that are shaping a polycentric model of green investment. It has been noted that the distribution of companies based on green bond issuance volume shows the significant dominance of state-owned banks and multinational corporations that actively support the development of sustainable projects. An analysis of the main issuers allows us to identify key areas of financing, in particular decarbonization, the development of renewable energy sources, and environmentally friendly transport, which emphasizes the need for further integration of environmental initiatives into international business strategies. Therefore, green finance is a key tool for transforming international business in the digital economy, ensuring sustainable development and the introduction of innovative financial mechanisms. To fully realize the potential of green finance, it is essential to overcome barriers, including information asymmetry, fragmented regulation, and political instability in some regions.

Keywords

Green finance; Green technologies; Digital economy; International business; Sustainable development; Transformation

Introduction

In modern conditions, there is an intensive penetration of digital technologies into all spheres of social functioning, which determines a qualitatively new stage of innovative progress. This stage is determined by the high dynamics of the introduction of information and communication solutions and the transformation of requirements for the functioning of both economic entities and social institutions. These processes have contributed to the emergence of new forms of economic interaction and knowledge dissemination, which are now one of the key characteristics of global reality, inextricably linked to the digital transformation of national economies. The rapid spread of digital tools at the global level has led to the large-scale integration of innovative technologies into the production and management processes of many developed countries, which, in turn, has contributed to the formation of strategies aimed at stimulating economic growth and social well-being. In particular, the use of digital solutions in areas such as public administration, healthcare, education, and the financial sector optimizes information exchange, increases the transparency of management procedures, and strengthens interaction between citizens and government agencies.

At the present stage, the transition to a low-carbon development model is also gaining momentum, leading to a growing need for non-traditional financing instruments. Green financing, designed to support initiatives aimed at reducing greenhouse gas emissions and adapting the economy to the effects of climate change, is recognized as one of the key mechanisms in this area (Kovalko, Eutukhova, and Novoseltsev, 2022). Over the past decade, the green bond market has shown a clear upward trend. For example, while in 2014 the volume of green bond issuance amounted to only $37 billion, by 2021 this figure had reached $633 billion (Statista, 2024). This growth reflects intensified international interest in climate initiatives. It also highlights the increasing role of states, transnational businesses, and financial institutions in financing climate initiatives, which indicates intensifying international interest in climate initiatives and the strengthening of the role of states, transnational businesses, and financial institutions in financing sustainable development. In addition, within the perspective of the growth of the global sustainable finance market, which covers a wider range of objectives based on ESG criteria [E (Environmental) - environmental aspects (including green finance); S (Social) - social responsibility (human rights, working conditions, etc.); and G (Governance) - quality of corporate governance], the quality and quantity of green financial products are expected to increase (Figure 1).

The forecast growth of the global sustainable finance market shows a steady positive trend: from $5.49 trillion in 2023 to an expected $38.19 trillion in 2034. Particularly noticeable growth is observed in the European market, where the volume in 2024 amounted to US$6.61 trillion, with a forecast of reaching US$15.28 trillion by 2034 at a compound annual growth rate (CAGR) of 20%. These rates are driven by the active integration of ESG factors, the development of sustainable debt instruments, and favorable regulatory policies.

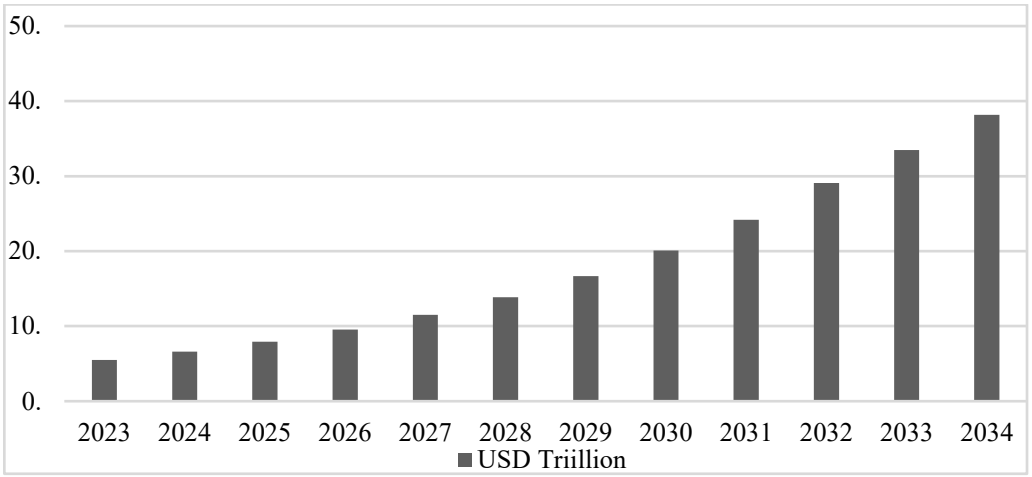

Figure 1: Forecast growth of the global sustainable finance market
Source: compiled by the author based on Market Us (2024)

The relevance of the topic is determined by the need to ensure effective financing of environmentally oriented initiatives in the context of digital transformation, which defines green finance as a key tool for adapting international business to the requirements of sustainable development and a low-carbon economy. The main research questions cover identifying the nature of the green bond market dynamics, studying the concentration of issuers by issue volume, and identifying the relationship between the activity of digital financial platforms and the structural differentiation of this market, which is analyzed and visualized based on statistical data analysis. This scientific article aims to provide a statistical summary of trends in the green bond market to identify patterns in their issuance in the digital environment, determine the role of major issuers, and clarify the mechanisms through which digital financial instruments contribute to the transformation of international business strategies towards environmental and social responsibility.

Literature Review

In the context of a dynamically developing digital economy, green finance emerges not only as a means of environmental modernization but also as a strategic tool for transforming international business, capable of combining innovative technologies with the principles of sustainable development. The shift in focus from the traditional paradigm of profitability to the creation of long-term value that takes into account social and environmental priorities (Popescu, Hitaj, and Benetto, 2021; van Zanten, Sharma, and Christensen, 2023; Zairis, Liargovas and Apostolopoulos, 2024; Zhang and Zhao, 2023) opens up new opportunities for the formation of business models integrated into the global digital infrastructure. The active implementation of digital solutions, including blockchain, artificial intelligence, big data, and financial technologies, significantly increases the transparency and efficiency of environmental investing and strengthens mechanisms for monitoring the impact of business on the environment (Desyatnyuk *et al.*, 2024; Krysovatyy, Desyatnyuk, and Ptashchenko, 2024; Yi, Chao Ma, and Zhao, 2024). As a result of the exacerbation of environmental risks, including the degradation of natural systems (Chowdhury *et al*., 2023), environmental pollution (Farooq *et al*.,

2023), and increasing greenhouse gas emissions (Dam *et al*., 2024; Desyatnyuk *et al*., 2025a), green financial instruments are becoming increasingly important for the systemic transition to a new model of the global economy (Mia *et al*., 2022). This change calls for both lessening the environmental impact and strengthening the contribution of global green trade to the spread of eco-friendly technologies (Bakulina and Ternopilska, 2021; Fusaro, 2005; Olasehinde-Williams and Folorunsho, 2023; Ostapenko *et al.*, 2024; Usatenko *et al.*, 2025; Khrushch, 2021; Kovalenko *et al.*, 2023). It should be emphasized that green bonds, social bonds, transitional bonds, and targeted loans are tools that require effective mobilization to ensure high-quality adaptation of enterprises to the requirements of climate policy, attract investments in eco-technologies, and form competitive digital-oriented markets (Gilchrist, Yu and Zhong, 2021; Lin, Cai and Huang, 2024; Park, 2018; Zairis, Liargovas and Apostolopoulos, 2024). This will enable green financing to serve as the primary force behind digital transformation in the global business environment and serve as a catalyst for sustainable development (Desyatnyuk *et al.*, 2025b; Reznikova *et al.*, 2024).

Recent studies highlight that there is a close relation between green lending policies, competition between banks, and corporate green transformation, and, therefore, the transformational phenomena accompanying international business activities require digital and environmental modernization of enterprises by integrating green financing into sustainable growth strategies. In this context, Tan *et al.* (2025) note that China's green credit policies have had a positive impact on the environmental transformation of companies, particularly in the context of high market competition between banks, both state-owned and foreign banks. The main mechanisms of this impact are the reduction of financial barriers and the promotion of corporate environmental responsibility. However, the effects of such transformation are much stronger in companies with a high level of environmental transparency, as well as in regulated industries and regions with stricter environmental standards. Researchers such as Safi *et al.* (2024), Wang and Yan (2023), and Zheng, Feng and Huang (2024) have noted that green finance is the most promising tool in shaping a global financial flow mechanism to support environmentally friendly initiatives. Among them, in their work, Safi *et al.* (2024) analyze the relation between digital transformation, green finance, and carbon emissions and emphasize the difficulties in the interaction of technological development and environmental indicators of financial markets. Nevertheless, taking into account the findings of Ng *et al*. (2021), green finance has four main directions in light of the quick adaptation to the emergence of transformational phenomena in the global economic environment: utilizing the international financial market to accomplish sustainable development objectives, enlisting developing nations in green reconstruction, boosting the economic feasibility of clean technologies, and creating global financial clusters to guide investments in sustainable infrastructure. This highlights the importance of international coordination and access to technology as factors for sustainable business development in the digital age, which is also reflected in the works of Bhutta *et al.* (2022), Saidin and O'Neill (2022), and Zhu (2024).

According to Lin, Liao, and Jia (2023), the main advantage of using green financing for businesses in the energy sector is the prospect of reducing the share of thermal energy production and stimulating the introduction of renewable energy sources. Such financing promotes the development of green technologies, reduces export-oriented production,

and modernizes the structure of the economy by redirecting investment flows (Lin, Cai and Huang, 2024; Qamruzzaman and Karim, 2024; Safi *et al.*, 2024; Zhu, 2024). At the same time, research by Yang *et al.* (2025) shows that political support for the green transformation of enterprises, particularly international companies and transnational corporations, through innovation financing programs (including PPCTF) significantly stimulates the development of green innovations, especially in the context of digital business transformation. In addition, the scientific findings of Nepal *et al.* (2024), Safi *et al.* (2024), Yang *et al.* (2025), and Zhironkin and Cehlár (2022) confirm the thesis of the complementarity of environmental and digital policies as the basis for the innovative renewal of the international corporate sector.

In general, the results of the synthesis of literary sources indicate that a green financial system, provided it is digitally modernized to form a digital economy, has significant potential to transform international business, making it more responsible, innovative, and adaptable to the challenges of climate transformation.

Methodology

The methodology of this study consists of a comprehensive analysis of data on green bond issuance volumes based on information obtained from the authoritative source Climate Bonds (2025). In particular, data for the period February-April 2025 was used for the analysis, supplemented by incomplete data for January and May 2025. The study contains data on the amount of bond issuance for each month, as well as information on the largest issuers and the financing areas for projects supported by green bonds. This information pertains to both private financial institutions and public authorities. To guarantee the scientific reliability and accuracy of the study, a systematic and phased methodology was applied, which includes:

1. Quantitative aggregation of total monthly issuance volumes and processing of each month as an independent analytical unit. This allowed us to identify time trends and fluctuations in market activity.
2. Analyzing analytical/rating agencies and databases (ABC, 2025; BoCom, 2023; Climate Bonds, 2025; Industrial Bank Co., 2023; Lloyds Banking Group, 2025; Sustainalytics, 2025) to identify the largest green bond issuers in the context of total issuance and qualitative aspects of the projects they financed, including sector focus and institutional origin (public or private);
3. Comparing quantitative trends with qualitative data on project types and issuer behavior, the study offered a multidimensional understanding of the green bond market in early 2025.

This step-by-step methodology contributed to a structured, data-driven narrative that is consistent with the evolving digital nature of financial analysis.

The total volume of green bond issuance was calculated for each month, which allowed us to identify the main trends and dynamics of this financial instrument (each month was considered as a separate unit to measure changes in issuance volumes). For this purpose, the data from the analytical databases were aggregated by month by summing up all individual green bond issues registered during each calendar month. The resulting monthly figures were then added together (using Microsoft Excel) to calculate the total

cumulative issuance volume for the study period, which served as the basis for determining quarterly and projected annual trends.

The resulting monthly figures were then added together (using Microsoft Excel) to calculate the total cumulative issuance volume for the study period, which served as the basis for determining quarterly and projected annual trends. In the context of this research, which emphasizes exploratory and descriptive-statistical analysis of green bond issuance patterns, Excel ensured operational efficiency, transparency of analytical procedures, and reproducibility of visual outputs. While advanced statistical software environments such as R, SPSS, or Stata provide broader capabilities for multivariate analysis, inferential statistics, and econometric modelling, they were deemed non-essential for the specific scope and objectives of this study. The focus was not on hypothesis testing or predictive modelling, but rather on revealing aggregate issuance dynamics, identifying dominant institutional actors, and mapping thematic funding priorities.

The next phase of the research involved a data-driven analysis of the biggest green bond issuers over the given timeframe. The volume of each issuer's output was taken into account, as well as the specifics of financing allocated for the implementation of environmental projects. Subsequently, the financing directions of each issuer were examined to determine the thematic allocation of raised funds (whether they were directed toward renewable energy, sustainable infrastructure, or green transportation). These themes were cross-referenced with issuer type to evaluate strategic priorities and sectoral trends. This allowed us to distinguish patterns of environmental investment priorities across different institutional categories.

The dataset employed is global in scope and encompasses officially labelled green bond issuances, as reported by the Climate Bonds (2025). No geographic restrictions (e.g., OECD-only) were imposed, allowing for inclusion of both advanced and emerging economies. Sectorally, the analysis is confined to certified green bonds, excluding sustainability-linked or broader ESG instruments, thus ensuring thematic and methodological consistency.

Trend analysis was implemented to predict future changes and identify potential trends between issuer types and issuance volumes and to conduct a more precise analysis based on the collected data. Excel was used to organize the monthly issuance data into a time series format. The direction and magnitude of the issuance growth over the months were visualized and assessed using both linear and polynomial trendlines. Moreover, the average monthly growth rates were determined to offer a better understanding of the rate of expansion in green bond activity. Pivot tables and charts were implemented to illustrate the distribution of issuance by funding sector and institution type.

In-depth research was done on the green bond market using both quantitative and qualitative data. Modern statistical and analytical tools are required to accurately identify the primary trends in the market, as the global economy becomes increasingly digital.

Results and Discussion

Currently, an important process for linking the impact of green finance to global business practices is the implementation of financial mechanisms within the framework of relevant digital technologies, which will allow global businesses to access innovative sources of capital, reducing their carbon footprint and modernizing corporate structures. The findings of Nepal *et al.* (2024) confirm the decisive role of green finance in promoting low-carbon technologies, especially in developing countries. In addition, the need to deploy hydro and wind power plants necessitates the need to attract additional funds, including through green banking, bonds, and lending, which in the long term will allow to formation of the basis for the greening of international production. At the same time, according to Wang and Yan (2023), digital platforms open the way for businesses to green financial products, while helping to optimize risk assessment processes and ensure greater inclusivity for investors. It is worth noting that digital transformation also increases the transparency of the green bond market and allows for mobilizing funds from global investors (Zheng, Feng and Huang, 2024). In the context of a digital economy characterized by rapid automation, widespread use of digital platforms, and the integration of innovative technologies into all areas of activity, green finance is emerging as a key tool for transforming international business in line with the principles of sustainable development. Given the forecasts of Market Us (2024) (Figure 2), according to which, by 2033, the global green finance market will reach $22.75 trillion. The growth rate is expected to be 21.7% annually. This demonstrates not only the dynamism of this sector but also its systemic role in shaping a new model of economy focused on environmental responsibility.

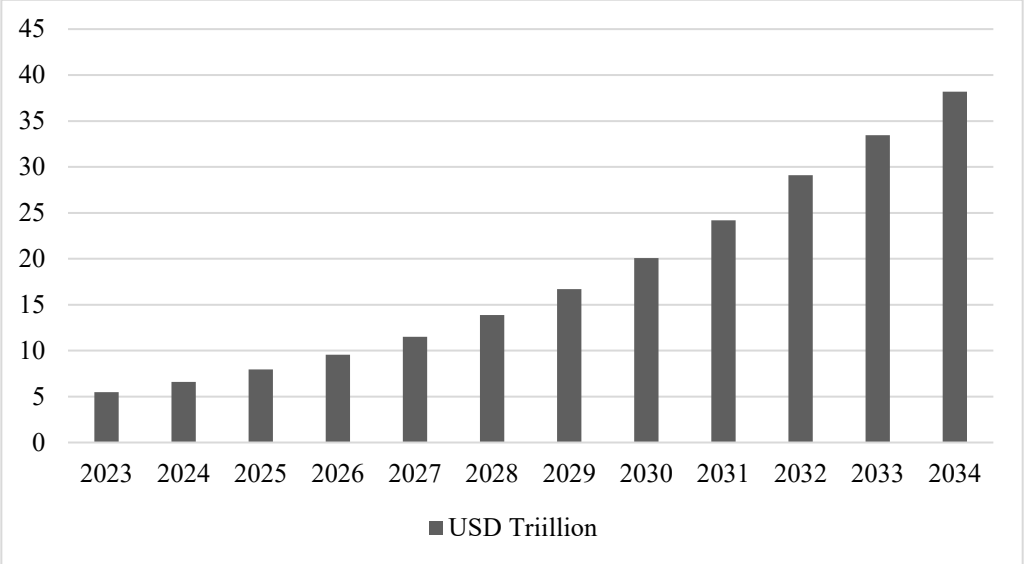

Figure 2: Forecast growth of the global green finance market
Source: compiled by the author based on Market Us (2024)

Green finance accumulates capital to finance projects that have a positive impact on the environment, particularly in the areas of renewable energy, sustainable agriculture, and environmental technologies. Green bonds dominate the structure of financial instruments

(40% of the market) and have already established themselves as a reliable mechanism for raising funds for environmental initiatives (Market Us, 2024). In the context of the digitalization of the economy, their importance is growing thanks to the ability to track the impact of investments in real time, ensure transparent reporting, and automate asset management. The total volume of green bonds issued, shown in Figure 3, shows a fluctuating trend, which correlates with the activation of digital financial platforms that contribute to unpredictable changes in the volume of investments in green initiatives.

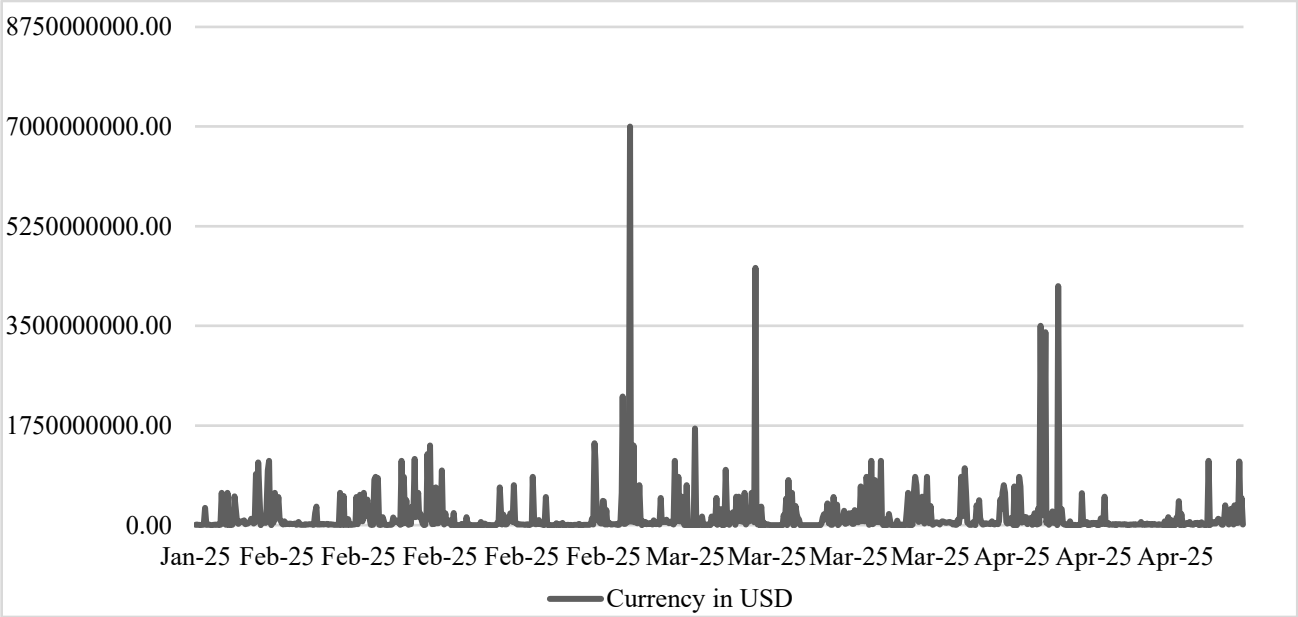

Figure 3: Labelled Green Bonds Data [*Source:* compiled by the author based on Climate Bonds (2025)]

In the context of increased sustainable financing, green bond issuance in the first two months of 2025 showed significant growth, indicating a deepening of investors' environmental focus and the growing attractiveness of such financial instruments. According to the latest data, the volume of green bonds issued in February-April 2025 amounted to approximately US$127.83 billion (Climate Bonds, 2025). In particular, in February alone, there were more than 160 issues, with individual issues reaching over US$1.1 billion. The range of such bonds includes both small institutions investing amounts in the thousands of dollars and major issuers whose role in building a sustainable capital market is fundamentally significant. This trend confirms the activation of financial mechanisms aimed at supporting environmentally responsible projects, among which energy conservation, the development of renewable energy, and infrastructure modernization remain priorities. At the same time, the diversity of issues attests to the wide range of market participants, from municipalities to transnational corporations, which creates the conditions for deeper integration of ESG principles into financial management systems.

In addition, as emphasized by Safi *et al.* (2024), digital technologies play a particularly important role in ensuring the "green" digital readiness of companies in the international market; this allows the integration of Big Data, blockchain, and artificial intelligence

tools into financial practices, which, in turn, increases the reliability of ESG reporting and ensures an accurate assessment of the impact of investments on the environment. At the same time, despite the positive dynamics, green financial infrastructure faces a number of challenges. As noted in Zhu (2024), key barriers remain information asymmetry, fragmented legal regulation, and low coordination between digital and financial institutions at the global level. Political instability in some countries also hinders transnational flows of green capital. In this context, political instability in a number of countries in the Middle East and North Africa (MENA) is a significant barrier to the formation of sustainable transnational flows of green capital. Although the region has exceptional potential for renewable energy development, particularly thanks to its natural conditions for solar and wind generation, systemic challenges - including political crises, the aftermath of the Arab Spring, job shortages, and a lack of basic infrastructure - are hampering the region's attractiveness to investors. Projects like Masdar City illustrate successful collaboration between the public and private sectors in creating environmentally neutral urban spaces (Saidin and O'Neill, 2022). On the other hand, as Cugurullo (2016) points out, political priorities often dominate environmental ones, turning environmental projects into instruments for legitimizing regimes, which creates additional reputational risks for foreign investors.

Despite the growing global demand for green capital and the need for significant investments in renewable energy, existing challenges, in particular limited resources, institutional weakness, and social barriers, lead to uncertainty about the further stability and predictability of the investment environment. That is, in the countries of this region, institutional and private investors, being in new conditions, are forced to integrate ESG (environmental, social, and governance) criteria into their investment strategies, which will fundamentally change the logic of doing business shortly. Corporations entering global capital markets with green financial instruments are demonstrating improved environmental performance and increasing their competitiveness by strengthening their reputation. In the context of digital transformation, this responsibility is reinforced by risk assessment algorithms, artificial intelligence, and blockchain technologies that minimize information asymmetries and manipulation. The role of states remains crucial: examples from the United States, with over $40 billion in US government loans for renewable energy, and the European Union, with its InvestEU investment program focused on implementing the Green Deal, demonstrate the effectiveness of public policy. In public loans for renewable energy, the European Union, with its InvestEU investment program, aimed at implementing the Green Deal objectives, demonstrates the effectiveness of public-private partnerships. Such cooperation allows international businesses to adapt to the requirements of decarbonization and the formation of a low-carbon economy. Leading industries, in particular renewable energy, which accounts for 45% of the green finance market, are becoming beneficiaries of investment and drivers of structural shifts in business models focused on climate neutrality and digital efficiency (Market Us, 2024). The use of smart infrastructure, digital twins, IoT systems, and big data analytics in such projects demonstrates the convergence of environmental and digital vectors in the strategies of transnational corporations. Therefore, green finance in the digital economy is shaping a new paradigm for international business, in which sustainable development meets regulatory requirements and societal expectations, serving as a source of long-term competitive advantage. This paradigm encompasses

both environmental and financial aspects, as well as technological innovation, as the basis for the sustainable transformation of global economic processes.

Consequently, political unpredictability and instability hinder the flow of green capital and increase the chance that multinational capital will relocate to nations with more stable political systems and predictable regulatory frameworks. This, in turn, exacerbates the asymmetry of global environmental development, as the countries that require the greenest investment to transition to a low-carbon economy are cut off from financing sources. The ability to accomplish the goals of global sustainable development is hampered by this imbalance, especially when it comes to energy transition, environmental protection, and adaptation to climate change (Bhutta *et al.*, 2022). OECD countries exhibit political stability, which serves as a significant driver of green growth by guaranteeing the stability of the institutional framework and fostering an environment that is conducive to green investments from multinational corporations (Qamruzzaman and Karim, 2024). It is institutional stability, combined with digital innovation, that enables international companies to effectively integrate environmental criteria into their financial planning, corporate strategy, and foreign economic activity, where sustainable investment instruments are becoming increasingly important, with green bonds playing a key role (Zhironkin and Cehlár, 2022). Their use allows financial resources to be accumulated for the implementation of environmentally significant initiatives, while contributing to the formation of a transparent and responsible investment environment. To visualize the structure of such an approach to financing environmental projects, it is useful to refer to a schematic representation of the green bond issuance mechanism (Figure 4).

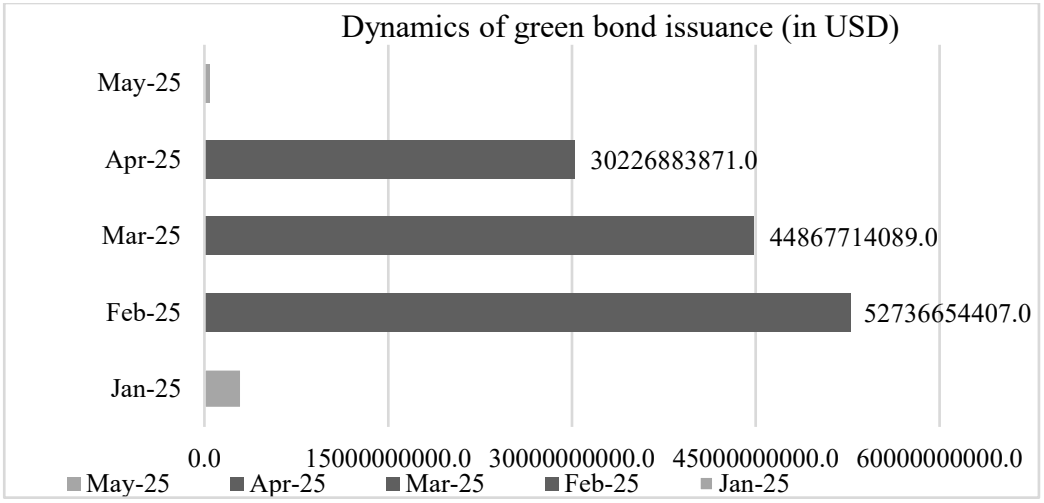

Figure 4: Dynamics of green bond issuance (in USD) [*Source*: compiled by the author based on Climate Bonds (2025)]
Note: periods containing incomplete source data are highlighted in light gray

During the first five months of 2025, there was significant volatility in green bond issuance volumes, reflecting both investor reactions to global economic challenges and the financial market's adaptation to environmental priorities. In addition, an analysis of green bond issuance dynamics indicates the growing role of sustainable finance in the transformation of corporate strategies. Other green financial instruments, such as bonds,

loans, and carbon certificates, are being actively incorporated into corporate strategies for sustainable growth. According to Negi, Manpreet and Singh (2024), it is the combination of digital marketing and financial innovation that enables international companies to implement circular economy principles, reduce primary resource consumption, and mitigate environmental risks. In this sense, the digital economy enhances the effectiveness of environmental finance and also acts as a catalyst for the formation of new models of sustainable development management. Therefore, to understand the scale and key players in this process, it is useful to analyze the structure of issuers in the green bond market (Koval *et al.*, 2023). Figure 5 shows the distribution of the ten largest companies by volume of green debt issuance, demonstrating growing interest from both transnational corporations and state-owned banking institutions.

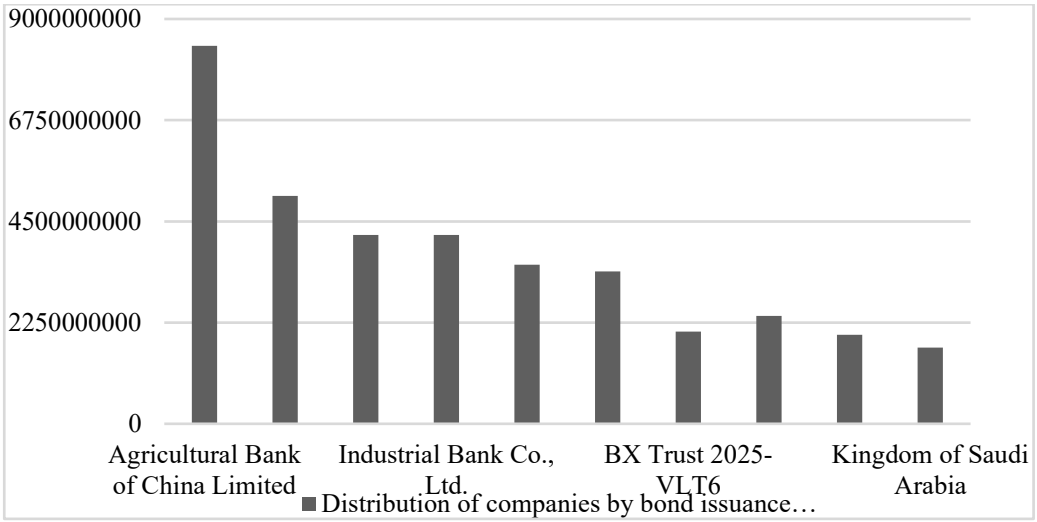

Figure 5: Distribution of companies by green bond issuance volume (in USD) [*Source*: compiled by the author based on Climate Bonds (2025)]

The data on the distribution of companies by green bond issuance volume is specified in table 1, which presents the main characteristics of the activities of key green bond issuers, as well as the areas to which the raised funds are directed.

Table 1: Major issuers and issuance volumes of green bonds

Name of issuer	*Issue volume (USD)*	*The essence of green financing*	*Main areas of funding*
Agricultural Bank of China Limited	8 400 000 000	The bank finances sustainable agricultural infrastructure and energy-saving technologies in the agricultural sector.	Green agricultural projects, irrigation, and clean technologies
European Investment Bank (EIB)	5 066 000 000	Invests in decarbonization, clean energy infrastructure, transportation, and innovation	Renewable energy sources, public transport, and infrastructure

Name of issuer	*Issue volume (USD)*	*The essence of green financing*	*Main areas of funding*
Bank of Communications Co., Ltd.	4 200 000 000	Attracts capital for the development of renewable energy and eco-friendly transport in China	Wind and solar energy, green transport
Industrial Bank Co., Ltd.	4 200 000 000	Funds water purification, energy efficiency, and clean energy projects	Renewable energy sources, water treatment, and green construction
Republic of Austria	3 534 500 000	Sovereign bonds to support environmental government programs	Forests, public transport, and energy efficiency
Federal Republic of Germany	3 390 000 000	Funds are allocated to climate transformation, decarbonization, and sustainable construction.	Energy transition, construction, innovation
SWCH Commercial Mortgage Trust 2025-DATA	2 400 000 000	Supports low-energy real estate properties	Data centers, green office buildings
BX Trust 2025-VLT6	2 050 000 000	Trust for financing sustainable real estate projects	Energy-efficient real estate, building retrofits
Lloyds Banking Group PLC	1 977 500 000	Loans for low-emission projects and energy-efficient housing	Residential energy efficiency, green infrastructure
Kingdom of Saudi Arabia	1 695 000 000	First sovereign green bonds in the region support hydrogen and smart cities	Hydrogen energy, smart cities, and sustainable transportation

Source: ABC (2025), BoCom (2023), Climate Bonds (2025), Industrial Bank Co. (2023), Lloyds Banking Group (2025), Sustainalytics (2025)

Leading positions are held by Chinese state-owned banks, in particular the Agricultural Bank of China, which provides large-scale financing for the greening of the agricultural sector, while European institutions such as the European Investment Bank (2025) and the governments of Austria and Germany focus on projects for decarbonization, public transport development, and energy infrastructure modernization. As Zhang and Zhao (2023) point out, such state initiatives are part of a strategy aimed at achieving long-term socio-environmental goals through green lending, which helps to accelerate transformational processes in the sustainable development sector. At the same time, the participation of private financial institutions, including trusts and banking groups, indicates the integration of ESG criteria into traditional financial practices, which increases the functional complexity and systemic nature of the green bond market. According to Yi, Chao Ma, and Zhao (2024), the emergence of these financial instruments shows a strong correlation between environmental investment performance

and financial innovation. This relationship promotes increased transparency and lowers environmental risks. A multicentric model of environmental finance is beginning to emerge, with various areas and sectors focusing on different types of funding. On the other hand, the transformation of international business under the influence of green finance reflects a profound structural change in approaches to capital formation, strategic planning, and investment behavior of companies, driven by a combination of institutional stability, digital innovation, and regulatory pressure at the global level. The usage of environmentally friendly financial products, especially green bonds, is changing not just in response to environmental issues but also in the way that global market players engage with one another. Companies that can use environmental, social, and governance (ESG) factors in their production and financial decisions will have an advantage in the new regulatory paradigm that is being created by sustainable financing mechanisms. Political pressure and government incentives to reduce carbon emissions are driving this change. Additionally, there is a significant rise in customer demand for clear, responsible, and eco-friendly financial products.

International corporations are, therefore, progressively integrating the discourse of sustainable investment into their corporate strategies and modifying their institutional architecture to meet the new demands of accountability, transparency, and investor trust. The increased emphasis on green bonds, which enable the accumulation of capital for environmentally significant projects, is indicative of a transition from conventional financial incentives to multi-level environmental and financial responsibility. Nevertheless, growing opportunities and challenges, such as fragmented regulations, high transaction costs, intricate environmental reporting, and restricted access to standardized data, are associated with traditional processes. Innovative financing mechanisms are impeded by these impediments, which also restrict the participation of smaller or underfunded organizations in the sustainable investment sector. Improvements in technology, such as digital reporting algorithms and data analytics, are facilitating the monitoring and auditing of environmental performance during this period. As a result, there is an increase in confidence in green instruments and a greater push to standardize environmental finance globally. In conclusion, it can be observed that the formation of a polycentric financial system with distinct sectoral and regional specialization is due to the heterogeneity of the regulatory environment and structural capabilities of different countries and companies. Thus, the green transformation of international business is not an isolated process, but is unfolding as a systemic interaction of global environmental challenges, financial innovations, and strategic adaptations that are fundamentally changing the architecture of the global economy.

Conclusion

The study found that green finance is an essential tool for transforming international business in the digital economy, promoting, above all, environmental sustainability and financial stability at the global level. The integration of digital technologies with environmentally oriented financial instruments helps to mobilize investment in sustainable development, in particular through the issuance of green bonds, which demonstrates growth in investment volumes and the attraction of new market participants. Particularly for investors who endorse sustainable development initiatives, the transition to a digital economy maximizes financial management processes,

guarantees market transparency, and enhances inclusiveness. Green finance offers significant opportunities for the integration of sustainable investment principles into corporate strategies. This is achieved by the development of instruments such as green bonds, loans, and carbon certificates, which allow companies to adapt to new environmental responsibility requirements and reduce environmental risks by introducing innovative financial activities. However, green finance is met with various challenges, including political instability in specific regions, fragmented legal regulation, and information asymmetry, which limit the efficacy of transnational capital flows, despite the potential benefits. Investment flows to nations with significant potential for the development of renewable energy are being impeded by political and economic crises, which are creating global disparities in the attainment of sustainable development goals.

Future research should concentrate on a thorough examination of how political unrest affects the efficiency of green finance in particular areas, especially developing nations, as well as how digital technology and legal regulation relate to each other. It should also develop suggestions for incorporating more efficient coordination mechanisms between public and private financial institutions. In addition, an important area for further research is the development of models for integrating digital economy principles into the financial strategies of international companies, in particular through the analysis of the implementation of innovative instruments such as green bonds and carbon credits against the backdrop of global economic challenges.

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Contribution	*Author 1*	*Author 2*	*Author 3*	*Author 4*	*Author 5*
Conceived and designed the research or analysis	No	No	No	Yes	No
Collected the data	No	No	Yes	No	Yes
Contributed to data analysis & interpretation	Yes	Yes	No	Yes	No
Wrote the article/paper	Yes	No	No	No	No
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